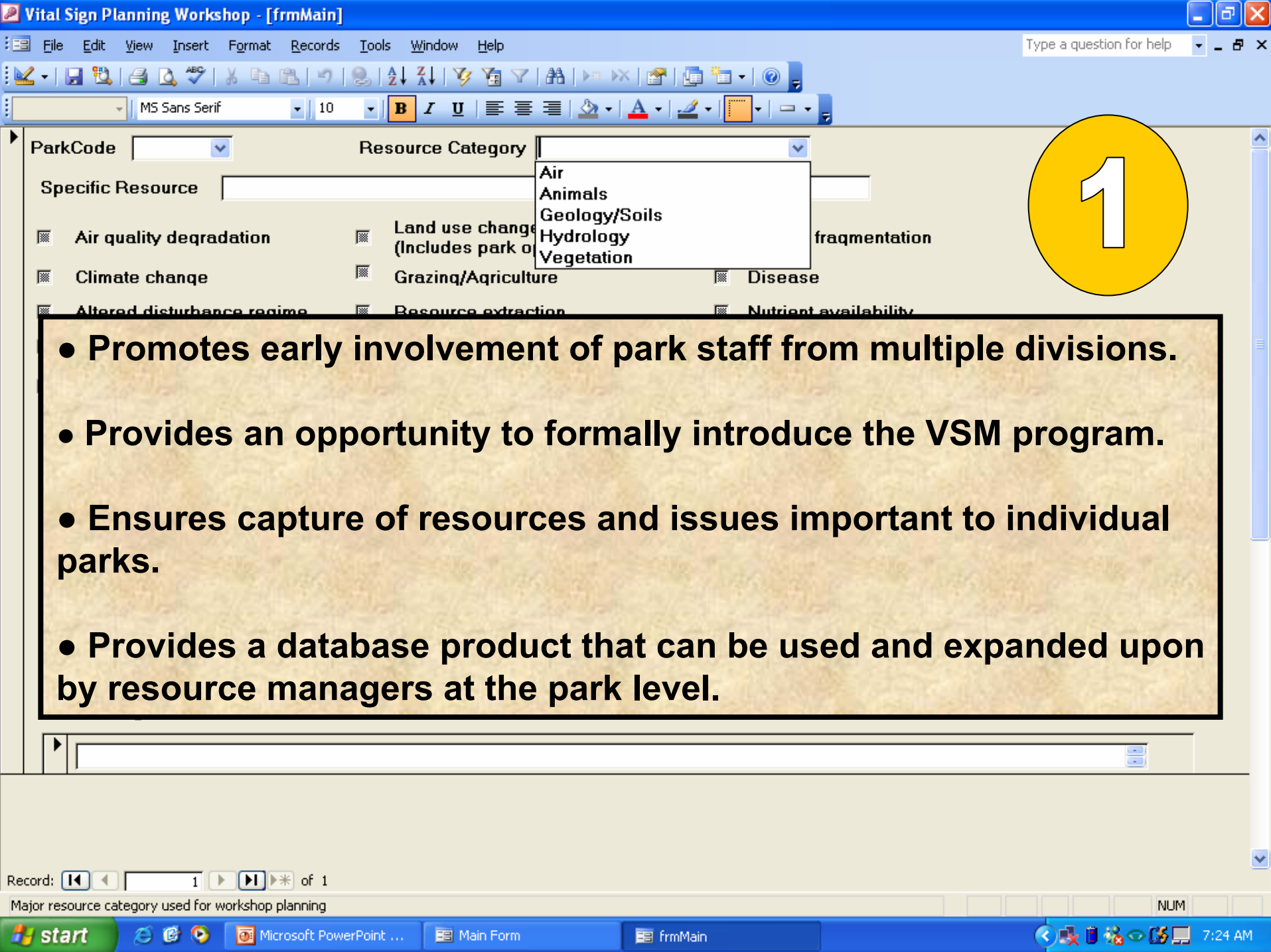
Workshop Approach to Vital Signs Identification and Prioritization

National I&M Meeting
February 2005


Vital Sign Planning Workshop - [frmMain]
File Edit View Insert Format Records Tools Window Help
Type a question for help
MS Sans Serif
10
ParkCode
Resource Category
Air
Animals
Geology/Soils
Hydrology
Vegetation
Specific Resource
Air quality degradation
Land use change
(Includes park o
fragmentation
Climate change
Grazing/Agriculture
Disease
Altered disturbance regime
Resource extraction
Nutrient availability
1
• Promotes early involvement of park staff from multiple divisions.
• Provides an opportunity to formally introduce the VSM program.
• Ensures capture of resources and issues important to individual parks.
• Provides a database product that can be used and expanded upon by resource managers at the park level.
Record: 1 of 1
Major resource category used for workshop planning
NUM
start
Microsoft PowerPoint ...
Main Form
frmMain
7:24 AM

Level 1	Level 2	Level 3	MOJN Vital Signs	MOJN Specifics
	Soil quality	Soil function and dynamics	Disturbance - soil surface	
			Soil organic matter	
			Soil chemistry and nutrient cycling	
			Soil hydrologic function	
			Presence and dynamics of Biological Soil Crusts	
			Desert pavement and mineral crusts	
Water	Hydrology	Groundwater dynamics	Groundwater dynamics and chemistry	
		Surface water dynamics	Surface water dynamics	
	Water Quality	Water Chemistry	Surface water chemistry	
Biol Integ				
				nd
				rses
				non-native fish
				Crayfish and other non-native invertebrates
				non-native frogs
				non-native birds
	Disease and Insect infestations	Animal diseases	Domestic sheep-bighorn sheep interactions	

2

- Facilitates a list of vital signs that represent the most significant resources and issues that parks have in common as well as capturing resources important to individual parks.

- Promotes consistency across networks (as appropriate) and with national program.

Review and Initial Prioritization by Park Staff

3

- Park staff WANT to complete ranking based on management significance - who better?

- More efficient use of expertise at network-level workshop – focus on ecological significance.

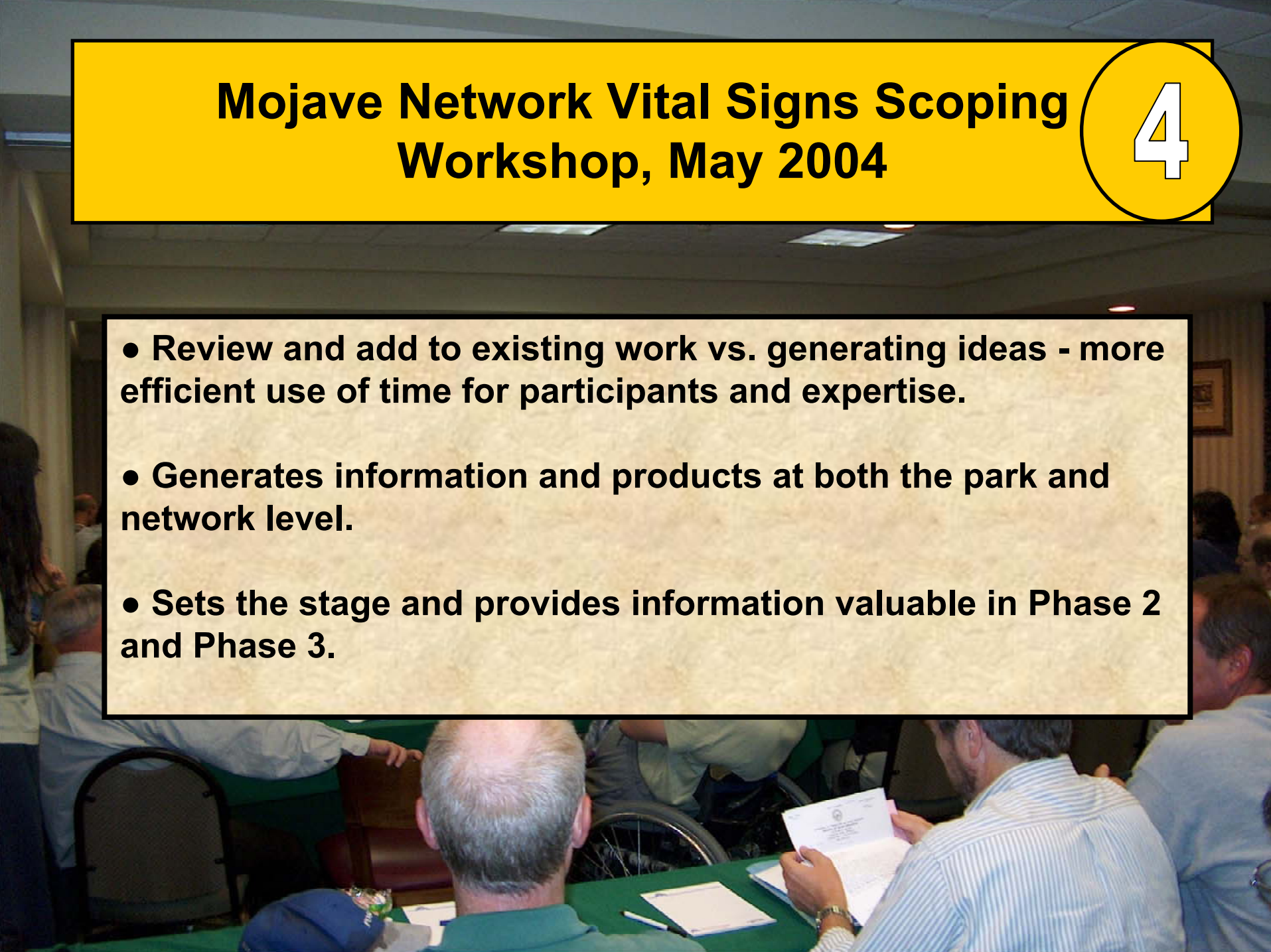
Mojave Network Vital Signs Scoping Workshop, May 2004

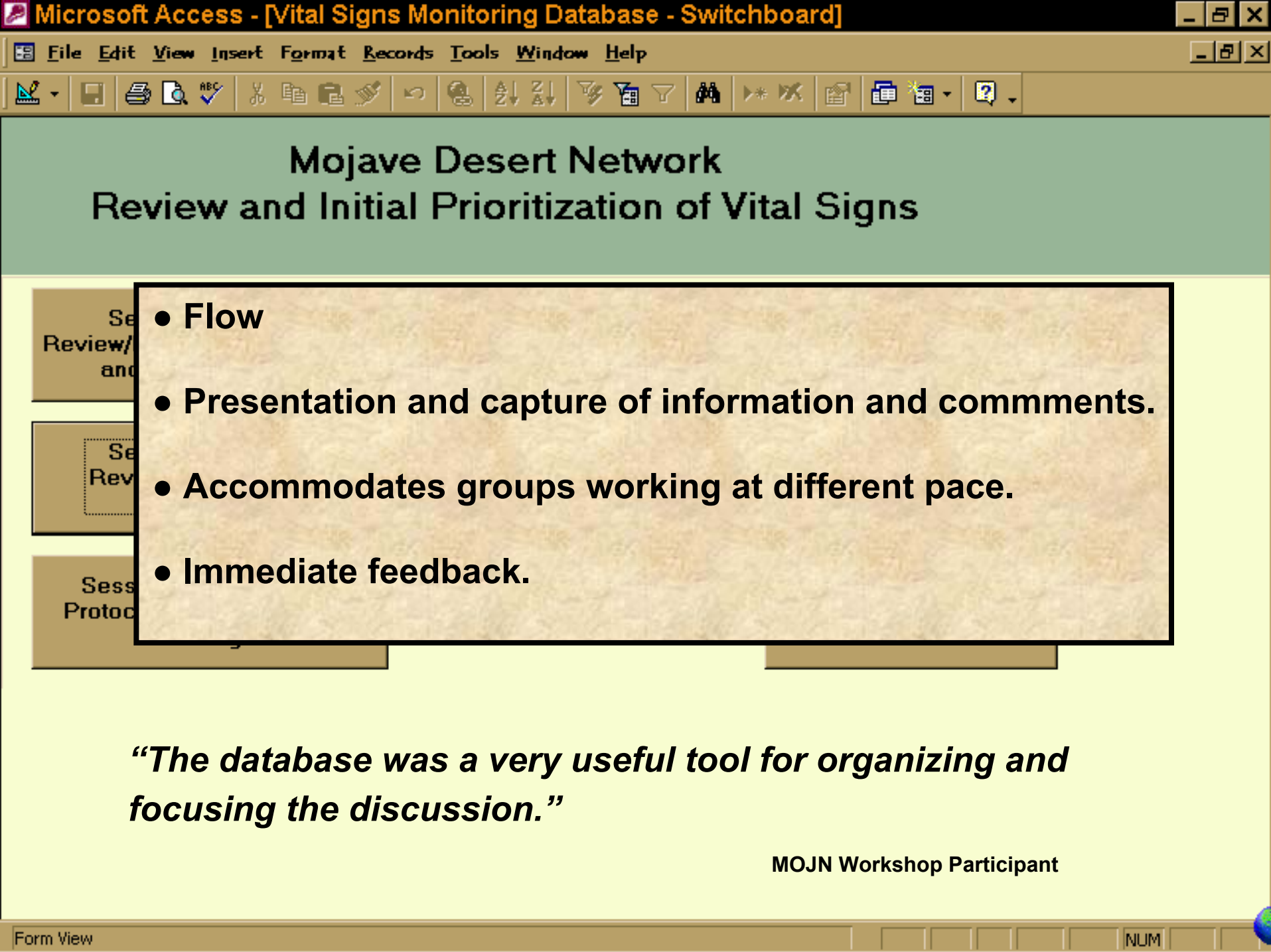
4

- Review and add to existing work vs. generating ideas - more efficient use of time for participants and expertise.

- Generates information and products at both the park and network level.

- Sets the stage and provides information valuable in Phase 2 and Phase 3.




Microsoft Access - [Vital Signs Monitoring Database - Switchboard]
File Edit View Insert Format Records Tools Window Help
Mojave Desert Network
Review and Initial Prioritization of Vital Signs
• Flow
• Presentation and capture of information and commments.
• Accommodates groups working at different pace.
• Immediate feedback.
"The database was a very useful tool for organizing and focusing the discussion."
MOJN Workshop Participant
Form View
NUM

Microsoft Access - [Review / Feedback on Level 2 Threats and Management Concerns]

File Edit View Insert Format Records Tools Window Help

Type a question for help

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ID Code: 0101

Level 1: Air and Climate

Level 2: Air Quality

Threats:

Declining air quality in network parks is primarily a result of urbanization adjacent to park units. Threats include both point and non-point sources of pollution. Specific causes of air quality degradation in and around parks include congenerational power plants, smog/ particulates/pollutants from Las Vegas, NV and Los Angeles, CA, increasing OHV use/vehicular traffic on unpaved roads (increased dust), vehicle emissions, watercraft emmissions, mining activities (e.g. waste tailings from Mountain Pass Mine), increasing ozone levels and increased fire frequency. Potential future threats to air quality include trucking of radioactive waste to the proposed Yucca Mountain storage facility and proposed commercial development on adjacent to parks (e.g. proposed Eagle Mountain Landfill adjacent to JOTR, proposed airport just north of MOJA)

Your Comments on Threats:

Nitrogen deposition is a major factor altering park ecosystems, potentially changing invasive spp abundance-- esp. JOTR because of air pollution.(Dr. Edi Allen can supply much more detail). Diesel trucks into Yucca Mtn will have significant effects on GRBA (+30/day) and MOJA. Air quality monitoring inside and outside parks currently underway by various agencies (like AQMD in CA)-- coordination needed. Parks without air quality monitoring need to establish asap as they are reference sites for the region. Many of these threats are external to the parks, and we only have a limited effect on making changes happen (ex. pollution from LA/LV) while others (such as vehicle exhaust and dust from unpaved roads inside the Parks) we can directly influence

Management Concerns:

Management concerns in network parks include loss of scenic vistas, night vistas and degradation of visitor experience, ecological impacts of ozone, CO2, nutrient enrichment caused by nitrogen deposition and other nutrients, potential impacts of atmospheric deposition and toxins on biotic and abiotic resources (e.g. impacts to wildlife species such as the desert tortoise, change in microbial communities, change in soil chemistry, spread of invasive plant species, alteration of fire regime, etc.), impacts to cultural resources (e.g. petroglyphs) and potential impacts to human health. At Great Basin NP, alpine lakes also are of concern due to their sensitivity to acidification.

Your Comments on Management Concerns:

Area of impacts of air quality on caves is poorly understood and needs research. May have different impacts based on karst vs lava tubes - changes in air quality also impact soils/hydro/etc. and ultimately cave

Distinguish between parks as a source of emmissions vs parks as a recipient - primarily related to particulates; seasonal variation in point source pollution

Go To Previous Record

Go To Next Record

Return to SwitchBoard

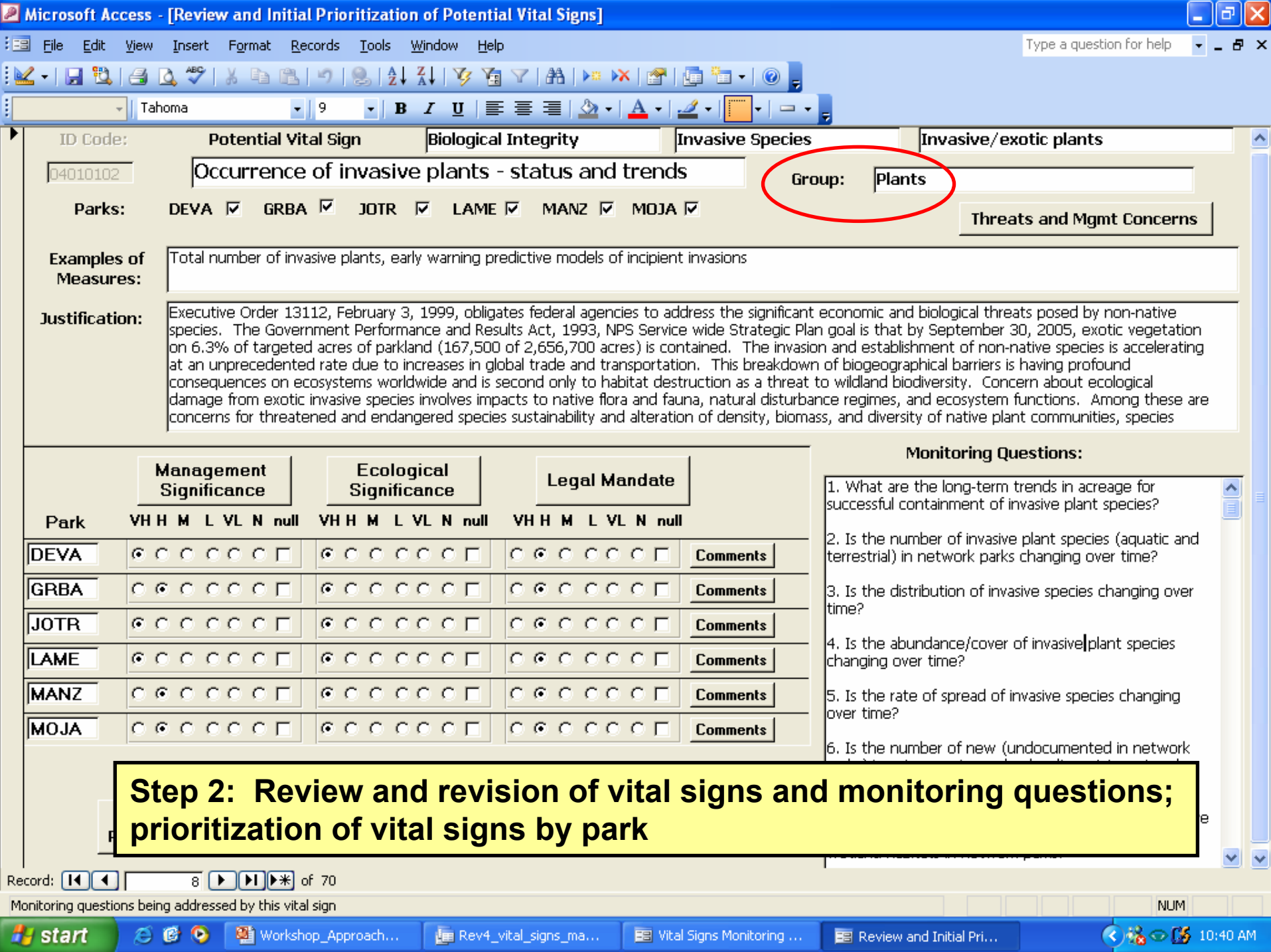
Step 1: Review of threats and management concerns at Level 2

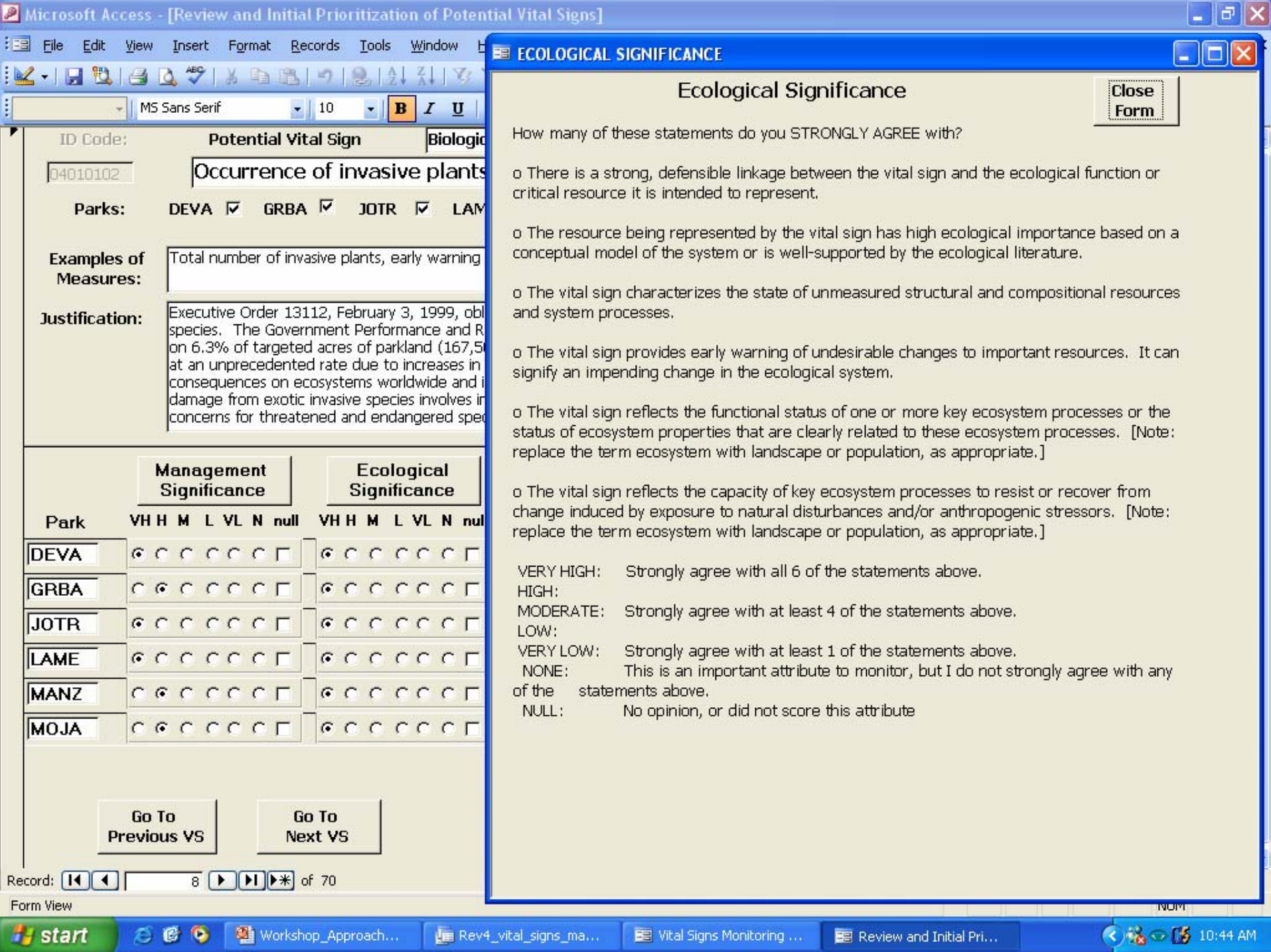
Record: 1 of 20

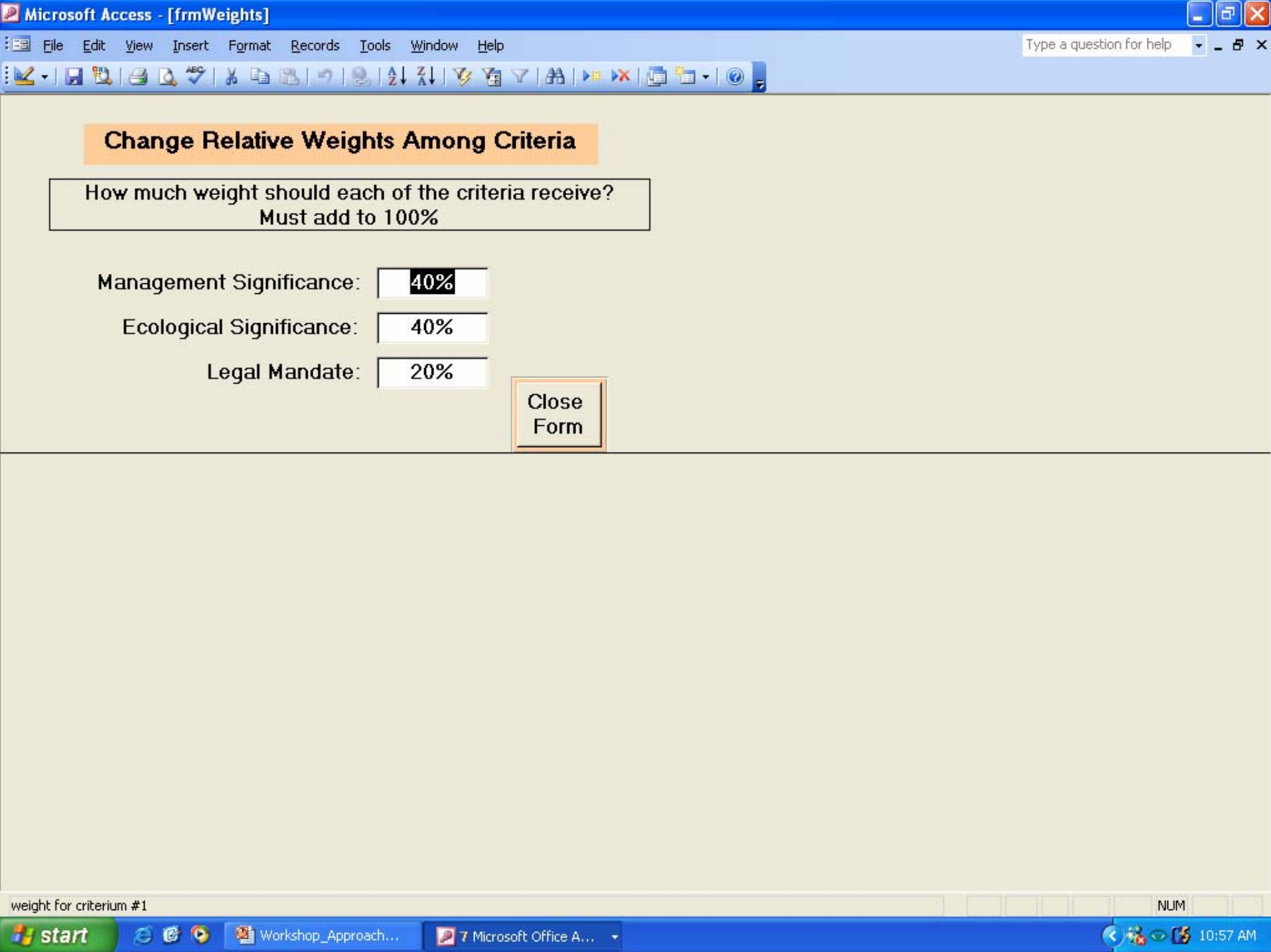
Additional comments about Threats to resources for this Level 2 category

NUM

start Workshop_Approach... Rev4_vital_signs_ma... Vital Signs Monitoring ... Review / Feedback o... 10:30 AM


Microsoft Access - [Review and Initial Prioritization of Potential Vital Signs]
File Edit View Insert Format Records Tools Window Help
Type a question for help
Tahoma 9
ID Code: 04010102
Potential Vital Sign
Biological Integrity
Invasive Species
Invasive/exotic plants
Occurrence of invasive plants - status and trends
Group: Plants
Parks: DEVA GRBA JOTR LAME MANZ MOJA
Threats and Mgmt Concerns
Examples of Measures:
Total number of invasive plants, early warning predictive models of incipient invasions
Justification:
Executive Order 13112, February 3, 1999, obligates federal agencies to address the significant economic and biological threats posed by non-native species. The Government Performance and Results Act, 1993, NPS Service wide Strategic Plan goal is that by September 30, 2005, exotic vegetation on 6.3% of targeted acres of parkland (167,500 of 2,656,700 acres) is contained. The invasion and establishment of non-native species is accelerating at an unprecedented rate due to increases in global trade and transportation. This breakdown of biogeographical barriers is having profound consequences on ecosystems worldwide and is second only to habitat destruction as a threat to wildland biodiversity. Concern about ecological damage from exotic invasive species involves impacts to native flora and fauna, natural disturbance regimes, and ecosystem functions. Among these are concerns for threatened and endangered species sustainability and alteration of density, biomass, and diversity of native plant communities, species
Management Significance
Ecological Significance
Legal Mandate
Park VH H M L VL N null
DEVA
GRBA
JOTR
LAME
MANZ
MOJA
Comments
Monitoring Questions:
1. What are the long-term trends in acreage for successful containment of invasive plant species?
2. Is the number of invasive plant species (aquatic and terrestrial) in network parks changing over time?
3. Is the distribution of invasive species changing over time?
4. Is the abundance/cover of invasive plant species changing over time?
5. Is the rate of spread of invasive species changing over time?
6. Is the number of new (undocumented in network
Step 2: Review and revision of vital signs and monitoring questions; prioritization of vital signs by park
Record: 8 of 70
Monitoring questions being addressed by this vital sign
NUM
start
Workshop_Approach...
Rev4_vital_signs_ma...
Vital Signs Monitoring ...
Review and Initial Pri...
10:40 AM


Microsoft Access - [Review and Initial Prioritization of Potential Vital Signs]
File Edit View Insert Format Records Tools Window
MS Sans Serif 10
ID Code:
Potential Vital Sign
04010102
Occurrence of invasive plants
Parks: DEVA GRBA JOTR LAM
Examples of Measures:
Total number of invasive plants, early warning
Justification:
Executive Order 13112, February 3, 1999, obl
species. The Government Performance and R
on 6.3% of targeted acres of parkland (167,5
at an unprecedented rate due to increases in
consequences on ecosystems worldwide and i
damage from exotic invasive species involves ir
concerns for threatened and endangered spec
Management Significance
Ecological Significance
Park
VH H M L VL N null
DEVA
GRBA
JOTR
LAME
MANZ
MOJA
Go To Previous VS
Go To Next VS
Record: 8 of 70
Form View
ECOLOGICAL SIGNIFICANCE
Ecological Significance
Close Form
How many of these statements do you STRONGLY AGREE with?
o There is a strong, defensible linkage between the vital sign and the ecological function or critical resource it is intended to represent.
o The resource being represented by the vital sign has high ecological importance based on a conceptual model of the system or is well-supported by the ecological literature.
o The vital sign characterizes the state of unmeasured structural and compositional resources and system processes.
o The vital sign provides early warning of undesirable changes to important resources. It can signify an impending change in the ecological system.
o The vital sign reflects the functional status of one or more key ecosystem processes or the status of ecosystem properties that are clearly related to these ecosystem processes. [Note: replace the term ecosystem with landscape or population, as appropriate.]
o The vital sign reflects the capacity of key ecosystem processes to resist or recover from change induced by exposure to natural disturbances and/or anthropogenic stressors. [Note: replace the term ecosystem with landscape or population, as appropriate.]
VERY HIGH: Strongly agree with all 6 of the statements above.
HIGH:
MODERATE: Strongly agree with at least 4 of the statements above.
LOW:
VERY LOW: Strongly agree with at least 1 of the statements above.
NONE: This is an important attribute to monitor, but I do not strongly agree with any of the statements above.
NULL: No opinion, or did not score this attribute
start
Workshop_Approach...
Rev4_vital_signs_ma...
Vital Signs Monitoring ...
Review and Initial Pri...
10:44 AM


Microsoft Access - [frmWeights]
File Edit View Insert Format Records Tools Window Help
Type a question for help
Change Relative Weights Among Criteria
How much weight should each of the criteria receive?
Must add to 100%
Management Significance:
40%
Ecological Significance:
40%
Legal Mandate:
20%
Close Form
weight for criterium #1
NUM
start
Workshop_Approach...
7 Microsoft Office A...
10:57 AM

File Edit View Insert Format Records Tools Window Help

Type a question for help

MS Sans Serif 10

Mojave National Preserve

5.0000	Surface water dynamics - streams, springs, seeps, lakes, playas
5.0000	Groundwater dynamics and chemistry
4.8000	Visibility and particulate Matter
4.6000	Visitor Use, Visitor Satisfaction and Visitation
4.6000	Chemical Contamination - Groundwater and Soil
4.4000	Springs/Riparian Restoration
4.4000	Occurrence of invasive animals - status and trends
4.4000	Occurrence of invasive plants - status and trends
4.4000	Ozone
4.2000	Federal T&E species
4.2000	Water Chemistry - Surface water
4.2000	Presence and Dynamics of Biological Soil Crusts
4.2000	Soil Hydrologic Function
4.2000	Soil chemistry and nutrient cycling
4.2000	Basic meteorology
4.0000	Bighorn sheep
4.0000	Riparian bird communities
4.0000	Riparian Communities (springs, seeps, stream riparian communities)
4.0000	Vegetation Change
4.0000	Wet and dry deposition
3.8000	Reptile communities
3.8000	Predators
3.8000	Desert tortoise disease

Each park now has a prioritized list of vitals signs that can be further refined but can be used 'as is' to identify high priority vital signs.

rd: 1 of 70

View

NUM

Microsoft Access - [Prioritized List of Potential Vital Signs]

File Edit View Insert Format Records Tools Window Help

Type a question for help

MS Sans Serif 10

Score	Vital Sign	VS_ID
4.8000	Surface water dynamics - streams, springs, seeps, lakes, playas	03010201
4.7333	Groundwater dynamics and chemistry	03010101
4.6333	Visibility and particulate Matter	01010301
4.6000	Occurrence of invasive plants - status and trends	04010102
4.6000	Occurrence of invasive animals - status and trends	04010201
4.5667	Ozone	0101010
4.5333	Riparian Communities (springs, seeps, stream riparian communities)	0403020
4.3333	Visitor Use, Visitor Satisfaction and Visitation	0503010
4.2000	Soil chemistry and nutrient cycling	0203010
4.1333	Water Chemistry - Surface water	0302010
4.1333	Soil Hydrologic Function	0203010
4.1000	Wet and dry deposition	0101020
4.0000	Basic meteorology	0102010
3.8667	Vegetation Change	0403010
3.8000	Soil erosion and deposition	02030101
3.8000	Riparian bird communities	04030501
3.7333	Disturbance - soil surface	02030104
3.6667	Atmospheric contaminants	01010401
3.6667	Springs/Riparian Restoration	05030104
3.5333	Patterns of precipitation	01020102
3.4000	Stream / wash channel characteristics	02010401
3.4000	Soil aggregate stability	02030102
3.4000	Soil biota	02030103
3.4000	Soil compaction	02030110

Record: 1 of 70

Park prioritization used to create network prioritization.

Immediate feedback! Participants re-grouped to see results of network prioritization process.

Name for this potential vital sign

NUM

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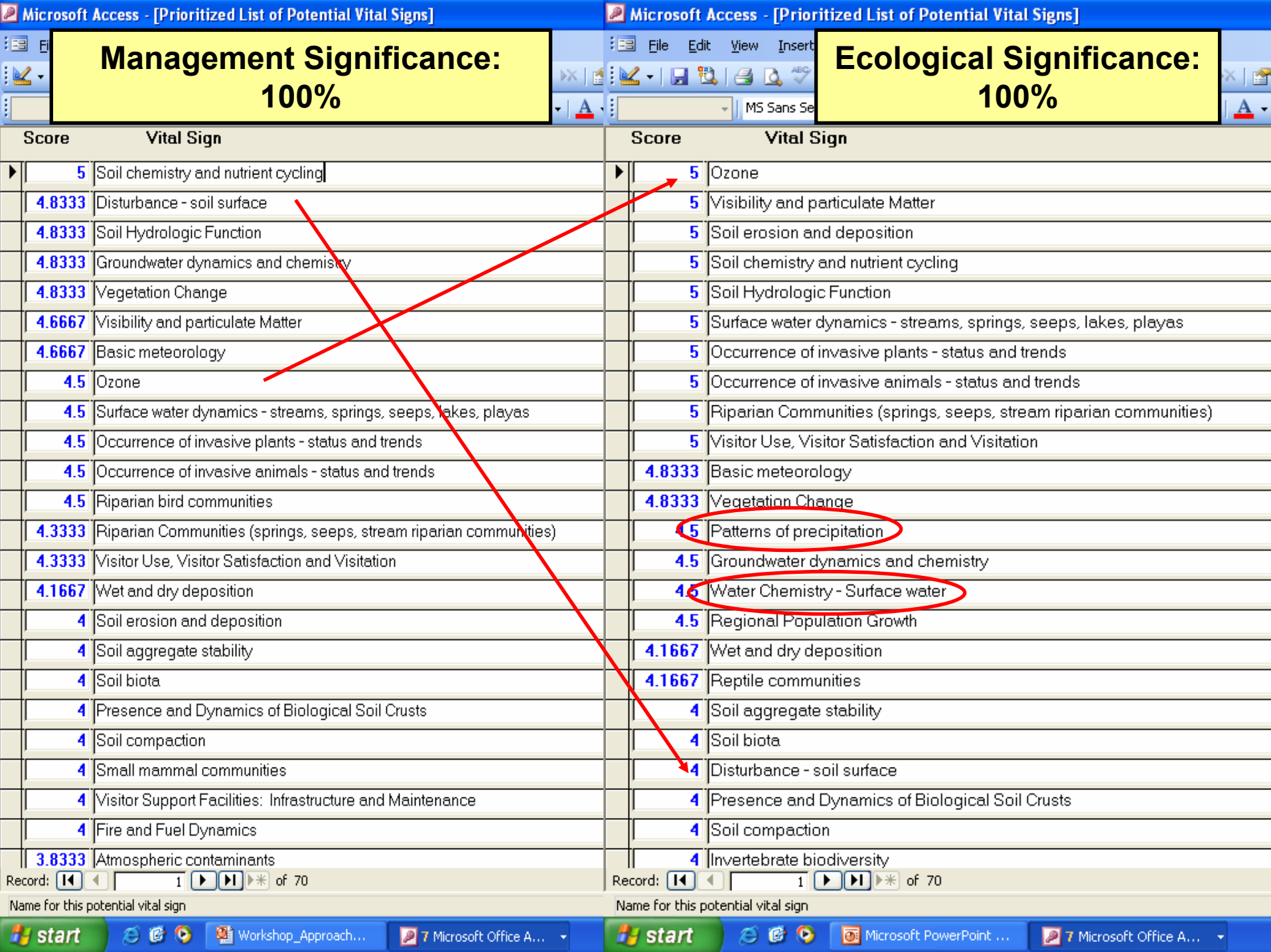
Microsoft Access - [Prioritized List of Potential Vital Signs]
Management Significance: 100%
Score
Vital Sign
5 Soil chemistry and nutrient cycling
4.8333 Disturbance - soil surface
4.8333 Soil Hydrologic Function
4.8333 Groundwater dynamics and chemistry
4.8333 Vegetation Change
4.6667 Visibility and particulate Matter
4.6667 Basic meteorology
4.5 Ozone
4.5 Surface water dynamics - streams, springs, seeps, lakes, playas
4.5 Occurrence of invasive plants - status and trends
4.5 Occurrence of invasive animals - status and trends
4.5 Riparian bird communities
4.3333 Riparian Communities (springs, seeps, stream riparian communities)
4.3333 Visitor Use, Visitor Satisfaction and Visitation
4.1667 Wet and dry deposition
4 Soil erosion and deposition
4 Soil aggregate stability
4 Soil biota
4 Presence and Dynamics of Biological Soil Crusts
4 Soil compaction
4 Small mammal communities
4 Visitor Support Facilities: Infrastructure and Maintenance
4 Fire and Fuel Dynamics
3.8333 Atmospheric contaminants
Record: 1 of 70
Name for this potential vital sign
start
Workshop_Approach...
7 Microsoft Office A...
Microsoft Access - [Prioritized List of Potential Vital Signs]
File Edit View Insert
Ecological Significance: 100%
Score
Vital Sign
5 Ozone
5 Visibility and particulate Matter
5 Soil erosion and deposition
5 Soil chemistry and nutrient cycling
5 Soil Hydrologic Function
5 Surface water dynamics - streams, springs, seeps, lakes, playas
5 Occurrence of invasive plants - status and trends
5 Occurrence of invasive animals - status and trends
5 Riparian Communities (springs, seeps, stream riparian communities)
5 Visitor Use, Visitor Satisfaction and Visitation
4.8333 Basic meteorology
4.8333 Vegetation Change
4.5 Patterns of precipitation
4.5 Groundwater dynamics and chemistry
4.5 Water Chemistry - Surface water
4.5 Regional Population Growth
4.1667 Wet and dry deposition
4.1667 Reptile communities
4 Soil aggregate stability
4 Soil biota
4 Disturbance - soil surface
4 Presence and Dynamics of Biological Soil Crusts
4 Soil compaction
4 Invertebrate biodiversity
Record: 1 of 70
Name for this potential vital sign
start
Microsoft PowerPoint ...
7 Microsoft Office A...

Microsoft Access - [Objectives, Protocols, and Partnerships for High-Priority Vital Signs]

File Edit View Insert Format Records Tools Window Help

Type a question for help

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ID Code: 04010102 | Potential Vital Sign: Biological Integrity | Invasive Species | Invasive/exotic plants

Occurrence of invasive plants - status and trends

Group: Plants

Examples of Measures: Total number of invasive plants, early warning predictive models of incipient invasions

Parks: DEVA ☑ GRBA ☑ JOTR ☑ LAME ☑ MANZ ☑ MOJA ☑

Threats and Mgmt Concerns

Justification: Executive Order 13112, February 3, 1999, obligates federal agencies to address the significant economic and biological threats posed by non-native species. The Government Performance and Results Act, 1993, NPS Service wide Strategic Plan goal is that by September 30, 2005, exotic vegetation on 6.3% of targeted acres of parkland (167,500 of 2,656,700 acres) is contained. The invasion and establishment of non-native species is accelerating at an unprecedented rate due to increases in global trade and transportation. This breakdown of biogeographical barriers is having profound consequences on ecosystems worldwide and is second only to habitat destruction as a threat to wildland biodiversity. Concern about ecological damage from exotic invasive species involves impacts to native flora and fauna, natural disturbance regimes, and ecosystem functions. Among these are concerns for threatened and endangered species sustainability and alteration of density, biomass, and diversity of native plant

Monitoring Questions:

1. What are the long-term trends in acreage for successful containment of invasive plant species?

2. Is the number of invasive plant species (aquatic and terrestrial) in network parks changing over time?

3. Is the distribution of invasive species changing over time?

Specific, Measurable Objectives:

Trends Monitoring:

1. To determine the trends in extent, frequency, abundance, and/or condition of a particular exotic species in a particular area over a specified time period.

2. To evaluate the rate of spread of particular invasive species over a set period of time within a defined area.

Existing Protocols: Natural Resources Inventory (NRCS); Forest inventory and analysis - phase 3 (USFS); Measuring and Monitoring Plant Populations (Elzinga et al 1996); North America Weed Management Association inventory and survey protocols; Nature Conservancy (probably has existing protocols); Ecological Resource Inventory (BLM handbook); Cal-IPPC guidelines; New Zealand Weed management plan; Lake Mead Weed sentry program;

Partnership Opportunities: FIA; USGS status and trends program; CAL-IPPC; Cooperative Weed Management Areas (e.g. Mojave WMA out of Barstow); NRCS; APHIS; USDA county programs; Southern Nevada Restoration Team (inter-federal agency); Native Plant societies (CA, NV); Clark County WMA; Lake Mead EPMT;

Session 2: For vital signs in top 20%, review justification, develop monitoring objectives and identify existing protocols and partnership opportunities. Review and add to others as time allows.

Specific Monitoring Objectives for this vital sign

NUM

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5

Category 1	*Biological Integrity*	**Category 2**	*Invasive Species*
Vital Sign	**Occurrence of invasive plants - status and trends**	**VS Cod**	
Applicable Parks	LAME MOJA JOTR GRBA MANZ DEVA		
Examples of Measures	Total number of invasive plants, early warning predictive models of incipient invasions		
Justification	Executive Order 13112, February 3, 1999, obligates federal agencies to address the significant economic and biological threats posed by non-native species. The Government Performance and Results Act, 1993, NPS Service wide Strategic Plan goal is that by September 30, 2005, exotic vegetation on 6.3% of targeted acres of parkland (167,500 of 2,656,700 acres) is contained. The invasion and establishment of non-native species is accelerating at an unprecedented rate due to increases in global trade and transportation. This breakdown of biogeographical barriers is having profound consequences on ecosystems worldwide and is second only to habitat destruction as a threat to wildland biodiversity. Concern about ecological damage from exotic invasive species involves impacts to native flora and fauna, natural disturbance regimes, and ecosystem functions. Among these are concerns for threatened and endangered species sustainability and alteration of density, biomass, and diversity of native plant communities, species extirpation/extinction due to changes in fire regime, and alteration of basic soil processes.		
Comments on justification	**Very best benefit: A network coordinator's perspective!**		